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ABSTRACT

A literature review, statistical analysis, and interviews were used to obtain a description of the vocational training system in Taiwan. Information was gathered about vocational trainers' background, the vocational training administration, vocational training laws and regulations, vocational training personnel, the curriculum, and instructional methods. Research findings indicated a high positive correlation between age and working experience and professional satisfaction. Vocational trainers were unhappy about personnel procedures, recruiting, lack of on-the-job training, few chances for promotion, and heavy work loads. Vocational trainers expected an improvement in administration and a social movement to retain confidence in vocational certificates. Research findings also suggested the need for: (1) an enhancement of vocational training administration; (2) adjustment of instructional packets; (3) improvement of coordination; (4) increase in full-time positions and budget; (5) revision of vocational training laws and regulations; (6) more on-the-job training; and (7) development of specific instruction models. Three models were suggested to improve the vocational education system: a labor force structure model to improve social mobility; an administrative model to encourage changes in the current vocational training administration; and a curriculum model to improve the instructional system. (25 references) (Author/KC)

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A Study of Vocational Training Model in Taiwan, Republic of China

——Abstract——

The development of man power resource is closely tied to the economic prosperity. With regard to full employment rate, Taiwan was heavily relied on labor intensive industries which put vocational training aside. Today, world trade competition revokes the demands of labor quantity expansion as well as quality improvement of vocational training in Taiwan. Owing to the increasing needs of skilled level workers which strongly affect Taiwan economic growth rate, vocational training becomes an effective tool while pursue high economic growth. Vocational trainers who take response for the critical duties of manpower development should have the regard of public attention as their public school partners. This study revealed facts related to vocational trainers: background information, vocational training administration, vocational training laws and regulations, vocational training personnel, vocational training curriculum, and instruction.

In order to obtain an adequate description of vocational training system, literature review, statistical analysis, and interview technique were all applied in this study. Based on the research findings three models were postulated to improve the vocational training system.

Research findings indicated a positive high correlation between age and working experience toward professional satisfaction. Vocational trainers were unhappy about the questions of personnel section in the questionnaire. They also complained about recruit, less opportunity of on-the-job training, few chances of promotion, and heavy work load. Vocational trainers expected a real improvement on current administration and a social movement to retain confidence of vocational certificates. Research findings also suggested: (a) an enhancement of vocational training administration, (b) adjustment of packet instruction, (c) imporvement of cooperative coordination, (d) provision of full-time-recruit positions and adequate budget, (e) revision of vocational training laws and regulations, (f) more on-the-job training, and (g) the development of specific instruction models.

Three modified models were formulated: a manpower structure model to improve the social mobility; an administrative model to encourage the changes of current vocational training administration; and a curriculum model to improve the instructional system.

Model Development

What is a model? How is a model developed? What is its value? What is its use in vocational training? These are the questions needing clarification.

Defining a Model

Good (1959) in the Dictionary of Education defines model as:

> a likeness that aids one in understanding a structure or a process, used by scientists when the phenomena studied would otherwise be indescribable or incomprehensible. (p. 371)

Szasz (1957) defines model as:

> the structure or function of a mechanism whose workings are familiar with the structure or functions of another which is less well understood. (pp. v,vi)

Deutsch (1952) classified models according to the four functions they can serve: organization, heuristic, predictive, and measuring. The organizing function of the model facilitates the ordering and relating of disjointed data and the showing of associations not previously revealed. As a heuristic device, a model may lead to the discovery of new facts and new methods. The predictive function facilitates forecasting on a rational basis through the observation of interrelated phenomena. As measuring device the model provides a means of quantification of the system under study. (pp. 356-357)

De Greene (1970, p. 10) noted that "models are analogies ranging from physical operating devices with definite shapes to block diagrams, figures, and computer programs. Models are valuable in explaining natural phenomena and can be applied to system development for purposes of conceptualization, research analysis, collecting design data, testing and evaluation."

Lippitt (1973, p. 2) noted that "a model is a symbolic representation of the various aspects of a complex situation or event and their interrelationships. The model serves as an aid to understanding the event or situation under study."

Each of these statements defining a "model" is an attempt to be practical and generalizable. Each differs from other in degree of abstractness, but each is hypothesized as being potentially capable of explaining all conditions in a great variety of specific situations. Drawing upon the above definitions, and for the purposes of this study, the model is defined as a description, a collection of statistical data, an analogy used to help visualize, or as a theoretical projection in detail of possible system of human relationships.

How a Model is Developed

The building of a model is modeling; modeling expedites problem solving due to the capability of involving conceptualized factors through visualized thinking. The skill of modeling is basically the process of conceptual elaboration and visual enrichment of the problem under study.

De Greene (1970), Silvern (1971), and Kast and Rosenzweig (1970) developed models for model building. Each of these models contain the essential elements of model design -- abstraction of real-world problem, tentative model construction, feed back mechanisms, model evaluation, model revision, and model validation. Ideas from each of the three models, development sequences were used in construction of the model for this study.

The Value of a Model

Lippitt (1973) lists several advantages of the use of a model as a planning instrument:

1. Models allow experimentation without risk.
2. Models are good predictors of system behavior and performance.
3. Models promote a deeper understanding of a system.
4. Models permit the relative significance of various factors to be determined.
5. The model indicates the type and amount of data which should be collected and analyzed.
6. The model permits consolidation of the problem as a whole. (pp. 79-83)

Knezevich (1969, p. 529) view models as being a significant intellectual tools for probing, describing, and comprehending complex phenomena. He observed that the use of models in educational training has been painfully slow. Knezevich stressed the fact that models are needed for better understanding of the activities and

behavior of professional personnel, the allocation of resources for the support of schools, the coordination of administrative echelons, information processing, and decision making. Further, he stated that:

> Inaccurate models are better than none for the effort demonstrates a concern for creating a conceptual framework and progressing beyond empiricism. Models are essential in doctoral level research. (p. 537)

It can be seen that the chief value of a model is that it enables one to ask questions and it offers clues as to how the questions can be answered. (Griffiths, 1959, p. 43)

Use of Models in Education

Models have a wide and varied use in educational administration. During the 1920's and early 1930's, the dominant thought in administration was to set up "models" (Campbell & Gregg, 1957, p. 105). A Comprehensive Dictionary of Psychological and Psychoanalytic Terms (English & English, 1965) points out many uses of the term, "models." Some are in line with common usuage, others more in line with scientific usuage.

> 1. a small copy of the real thing. 2. that which is to be copied, esp. an ideal or perfect form of something. -- Syn. pattern. 3. a physical device that shows how something works (a working model), or that displays the relationships of parts of a whole (e.g., a model of the solar system). . . . 4. a description of a set of data in terms of according to the rules of the system. The resulting transformations are translated back into the language of the data, and the relationships discovered by the manipulations are compared with the empirical facts. (p. 326)

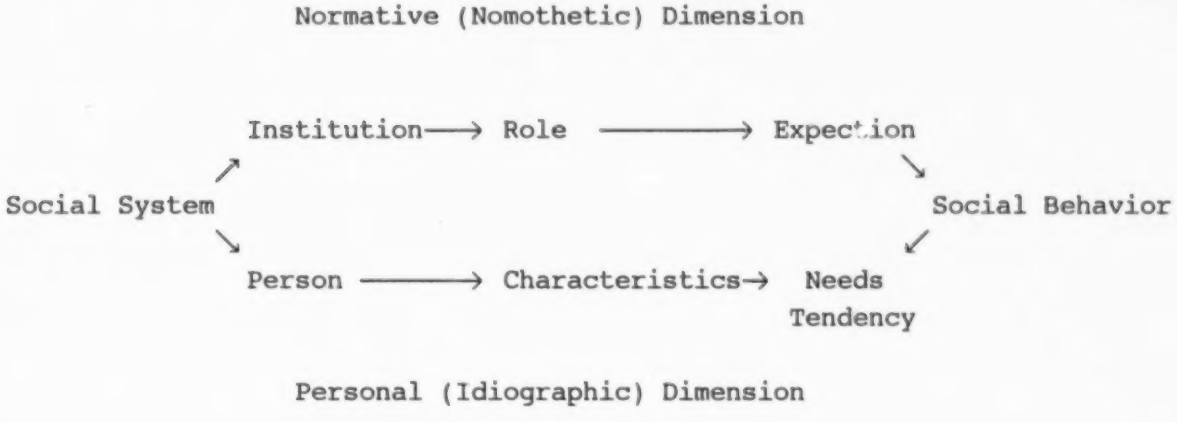
The fourth meaning above is probably the most precise and theoretically significant meaning in education.

Getzels (1958, pp. 150-165) presented a model from both the idiographic (personal) and nomothetic (normative) dimensions (see Figure A). In his model, each term on each of the two axes is the analytic unit for the term preceding it. The social system, for example, is defined by its institutions, each institution, by its constituent roles, and each role by its expectations. The general equation for his model is:

$$B = f (R * P)$$

Where B is observed behavior, R is institutional role, and P is the personality of the particular role incumbent. Organizational behavior is the interweaven result of these two factors. Getzel indicates that it would be necessary to cover these two fields if we need to understand, predict, or control organizational behavior. In other words a sociological analysis to an institution and psychological analysis to a person both are necessary.

Figure A: The normative and personal dimensions of social behavior



Source: (Getzels, J. W., and Guba, E. G. Social behavior and the administrative process. School Review, 1957, 65, p. 429)

Getzels, Lipham, and Campbell (1968) explained:

> It must be understood that any theoretical formulation is a selective abstraction from reality and as such an over simplification . . . . A number of potentially significant variables have necessarily been omitted. But it is wiser in our opinion to know that one has explicitly omitted certain elements in an analysis than to believe foolishly that he has dealt or can deal equally with all the elements, which in fact (it) is impossible to do at the current stage of conceptual and methodological development. The hope of admittedly incomplete formulations may come more inclusive and satisfactory formulations. (p. 107)

Getzels et al. (1968) later indicated that a model serves the purpose of providing a framework in which to discuss administrative behavior.

Models and its use in vocational training

According to the above statements models can be applied in the vocational training and its administrative planning; it seems that all of vocational training related work can be improved integrally or partially by model development; no matter it is administration, instruction, policy making, or research development.

Vocational Training Models

Vocational training institutions can develop their long, or median range planning according to national man power planning. This, of course, is the base point of all vocational institutions. The weakness is its feedback response. It can hardly revise the needs of fast changing society. This study intends to provide three models for vocational training: A. man power model B. administrative model C. instructional model. Therefore this model discusses its input, output, and the model-related factors.

A. Man power model for vocational training

Summary of man power problem

According to Council for Economic Planning and Development (ECPD), Executive Yuen, Republic of China, 1988, Mr. Chang, P. (1988, p.24-52) indicates that "Taiwan area started its family planning in 1964; and proclaimed population policy in 1969. In 1980, Taiwan proceeded to quality birth and health keeping. . . . In 1984, a married couple in Taiwan bear 2.1 children and it decreased to 1.7 in 1987. At the same period of time the natural birth rate drop to 11.1 in a thousand. This goes ahead of 1983's schedule policy -- to approach 12.5 thousandth in the year of 1989." Further he added: "By the population registered in 1987, Taiwan area has about 1,967 millions. This amount is much more than double times of the population in the first year of Taiwan rehabilitation in 1945."

Manpower keep at a steady age structure has been called "zero population growth rate (ZPGR)". Most developed countries achieve this ZPGR in a very long period of time. Thus, even if ZPGR is the best population policy there is no short cut to achieve it. Freeman, R.

(March, 1986) from the University of Michigan proposed that the gross birth rate (GBR) of Taiwan should stay on 1.9 level and the estimate natural birth rate should approach ZPGR in the year of 2030. Thus, he suggested that Taiwan should go mild natural way to prevent from linkage crisis among different age groups. ECPD expected a natural GBR steady on 1.6 level this also indicates a possible ZPGR in 2020 with twenty four millions of population.

Population estimation has been limited to interaction of many variables: social economic changes, environmental pollution, population density, culture tendency, aged structure, resources distribution, etc. All these variables affect the achievement of ZPGR. It is the matter of time, all of nations will achieve ZPGR. A high quality birth and healthy life is the goal of our global policy. Man power supply in Taiwan will gradually decrease as the natural birth rate decrease from 2.05% of 1976 to 1.2% of 1986. The tendency will keep going. As Taiwan reaches the year of 2000, the natural birth rate should down to 0.7% level. At the same period of time, aged from 15 to 64 group their growth rate down from 3.08% to 1.8% and should down to 1.3% at the year of 2000. The future working labor is decreasing in 15 to 29 aged group; for 30 above aged group is still mild growing. Aged group from 45 to 54 is the fast growing group among others before the end of this century the average growth rate is 3.5%. This man power structure provide us a clear picture that decreasing supply of man power labor is the future trend. This is very good for elevation of industrialization and automation.

By the facts layout above, vocational training man power model must concentrate on quality labor and extensive additional labor worth.

Possible Model Structure

Education is an integral part of national economic interaction. The basic education of a labor could support him for couple decades. All of poor educational policy could provide negative effect to its national economic development. At this fast changing technological society the effect could be worst. For a better improvement of vocational training management, a vocational training man power information system model was developed. This model is developed according to system model development method of Forrester, 1961; 1968; 1969; 1971.

To vocational training "instruction" is its most important activities. Many well trained instructors working in different technical areas, they escalate the advanced technological concepts

and motivate our economic inputs which leads to quality products, better and faster outputs. This implies that a technical training and the processes of getting better education could make a big difference in national economic development. (Miniberger, 1982)

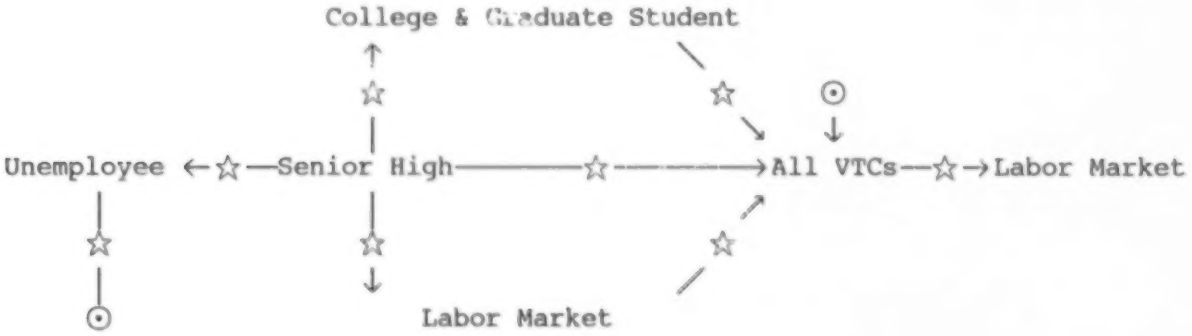
The purpose of model development is to provide a better management for vocational training. Especially, the decision of student enrollment must keep pace with the national growth. Model was developed as Figure B.

Figure B: Vocational Training Man Power Model

(A) Basic Model (by Educational level as an example)

(B) Flow Chart of Man Power Model (Senior High Graduates as an example)

⊙ Connection ☆ Decision Point → Flowing Direction



Zeigler, B. P. (1984, p.23) in his "Tree Formalism" stated:

Parameters : nodes, root, successor function

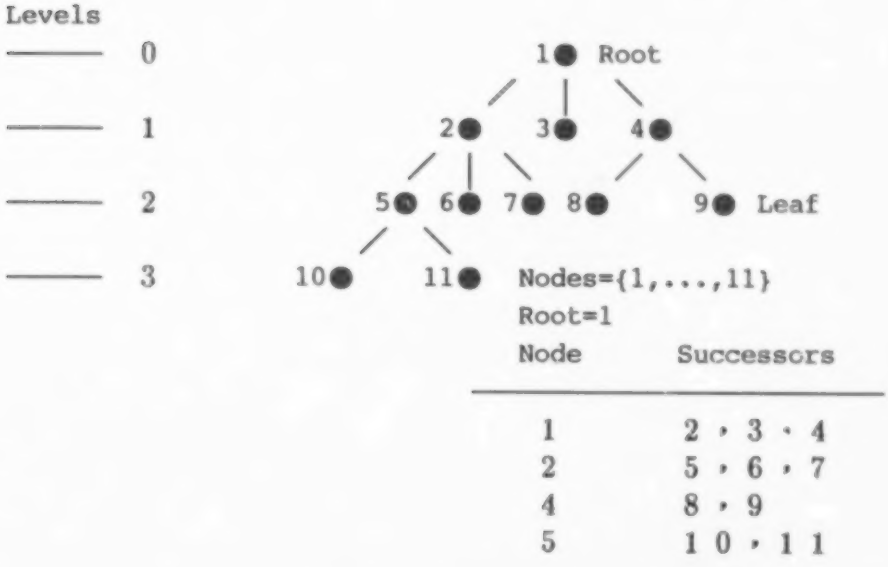
Constraints: nodes is a finite set;
root is a member of nodes
successor function assigns to each node a subset of nodes called its successors
root is not the successor of any node,
every other node is a successor of some (unique) node
the successors of distinct nodes are disjoint
a node is not in its own successor set

If vocational training institutions were taken as a "root", all of student members in these institutions will be a "leaf". Suppose students were categorized into several groups according to their educational background: junior high, senior high, junior college, and college graduates. Students come from different educational background have the same attitudes of getting employable skills. Their training method should not be the same. Thus, vocational training institutions should have different level of courses, varied training contents, and teachers.

The proportion of students in all VTCs among the youngsters of the same age group, who drop out from school and do not participate in any regular labor market, will help us in figuring out the approximate numbers of different age strata in VTCs. If the labor wanted in specific age group is available, then, the adjustment of VTC's training capability become possible. Also a man power forcasting of a specific age group will be an easy task.

For instance, it is possible to divide students into five different categories according to their educational background. That means in each VTC (as a root) there are five nodes; in each nodes there are other subset of nodes (could be divided by any other factors such as: sex, age, districts, etc.) These kinds of categorization only provides limited resources of man power distribution. For a better clear picture of man power structure, age group classification is one of the best choice. A tree model is displayed in Figure C to explain the basic concept of vocational training man power distribution. To a steady man power structure, VTCs as a whole should be able to predict as closely as the number is.

Figure C: Vocational Training Man Power Distribution (Tree Model)



Node	Successors
1	2 , 3 , 4
2	5 , 6 , 7
4	8 , 9
5	1 0 , 1 1

(Source: Figure quoted from Zeigler, B. P. 1984, p. 24)

Feedback System

VTC man power model suggested that VTC administrators should adopt data from Man Power Planning Group of the Council for Economic Planning and Development (ECPD), Executive Yuen. It will be a great help in course design and will provide a better choices for trainees. The age strata is under the control of gross birth rate. Its distribution and statistics should be scheduled under the control of the national development plan, and should be able to control or to estimate under limited errors. If national policy is a constant, then, members join the VTCs should be able to control under a limited change rate. It will occur a few errors only, and is very easy to adjust according to social changes. Its formular is very simple and can be estimated very accurately even thought there is not feedback system.

A social system is not that simple. Some factors such as: social changes, dichotomous policy, error adjustment, increasing involvement of other unexpected variables, all contribute to the man power system. An accurate formular is depending on long term evaluation of feedback system. Thus, a regression analysis is possible only under a long term revise of man power statistics to forcast VTC's man power model.

Model Evaluation

According to Models in Figure B and C, it only provides a simple man power structure, and is over simplified. There are more factors needed clarification. It also provides a clear concept of how to control human resources. If we had the clear relationship between input and output, estimated proportion rate, or algorithm of the formula then a forcasting is possible.

Model Revise and Integration

Under current system national man power policy affects model development most. Thus, a revise of policy also affects the revise of model. An integral and effective model should be revised under current statistics. The way of "how to procede" is described fully by Forrester (1961, 1968, 1969, 1971) and Miniberger (1982).

Summary

This study was surveyed under very limited budget, co-worker, facilities, and time span; otherwise, it could be formulated in mathematic formula and solved by computer simulation software.

B. Study of Vocational Training Administrative Model in Taiwan

Summary of Problems

According to Figure D of the current VTC administrative structure, the following questions will be proposed:

(A) Input

What is the current social demands to VTC institution, is the question needed to be clarified first. "Mid and long range man power developing plan of The Republic of China(1986-2000)" indicated that "For industrial escalation and labor structure reformation, to promote enterprise quality and productivity will be the trends for the future. VTC planning should concentrate on technological development of different skill labor training. It should adjust needs of varied vocations and cope with the social changes to upgrade the full employ rate. Otherwise, a job security concept is needed through career training to make all of civilian employable." (p. 61-62) Further it stated that: "Within the planning stage VTC should follow the rules such as:

1. to execute vocational training laws effectively and to establish career training system gradually.
2. to encourge all kinds of business and industrial training.
3. to provide trainings for job transfer and enhancement and to eliminate structural unemployment.
4. to provide trainings for those long term unemployee.
5. to provide service related vocational training due to economic and social demands.
6. to provide international trade and management training and to upgrade managing efficiency.
7. to encourge skill certifications.
8. to enhance the inter-relationship between vocational training and operational skill education."(p. 62-63)

Based on the rules above, VTCs need to pay more attention to the following aspects:

1. All VTCs are not familiar with man power market; they have problems in recruiting members.
2. Three hundred fifty thousands of junior high graduates each year, among them three hundred thousand go to senior high; ten thousands go to VTCs; and there are forty thousands with no one caring about their future. Vocational training could be a solution to this problem. Till now, there is still no answer to this question.
3. To those drudgery jobs, VTCs propose nothing for the answer.
4. Even to those brilliant occupations, all of business or enterprise managers invested nothing to man power upgrading plan.
5. All VTCs had limited chances to hire quality vocational trainer.
6. All VTCs run in heavy load with low pay is not easy to maintain high morale.
7. All of VTCs belong to several different administrative system. It is not easy for them to get cooperation.
8. All VTCs have different budget resources which causes unfair treatment.
9. There is no support or guidance to handicapped vocational training.
10. All of legal matters, with regard to legislation or institution are roughly made.
11. According to current vocational training administration, vocational trainers have no job security.
12. To those high technology courses, VTCs have limited choice to provide faculties and facilities.
13. Too few investment is put in vocational training.

(B) Output

According to Vocational Training Bureau "Enhanced Vocational Training Plan (1982-1986)", VTCs should:

1. Expand vocational training capability
   (1) To design all of training course and training capability
   (2) To expand "The first youth training center"
   (3) To expand "The central vocational training center"
   (4) To establish three new vocational training centers
   (5) To advise all of business and industries to invest in trade skill training
   (6) To advise all of enterprises to invest in trade skill training

(7) To design trainings for job transfer
(8) To design trainings for handcapped persons

2. Upgrade training quality
(1) To provide in-service trainings
(2) To provide high-level-skill-labor training
(3) To provide promotion trainings
(4) To provide facilities for vocational high school students
(5) To improve trainings for vocational trainers
(6) To improve training materials, instructional media and instructional methods
(7) To establish VTCs research center
(8) To provide inter-VTCs instructional evaluation

3. Establish vocational training system
(1) To legislate vocational training acts
(2) To establish systems for vocational professionalist
(3) To set up course standards for VTCs
(4) To enhance skill certification
(5) To enhance skill Olympic competetion
(6) To set up financial standard for each training course
(7) To set up budget systems for trainers
(8) To investigate skill labor demands
(9) To establish VTCs facilities data

According to Vocational Training Bureau "Enhanced Vocational Training Plan (1986-1990)", VTCs should:

1. Enhance vocational training
(1) To enhance public vocational training
(2) To promote business and industrial training
(3) To enhance service related vocational training
(4) To provide job transfer training
(5) To enhance handicapped vocational training
(6) To provide short term training for vocational school to concentrate on specific skill mastering

2. Escalate training level
(1) To increase both quantity and quality of vocational trainer
(2) To introduce good training methods or system from foreign countries
(3) To develop vocational training material and media

(4) To cultivate vocational moral concept and occupational respect attitude
(5) To enhance research and development of vocational training
(6) To evaluate vocational training system and its cost effect
(7) To enhance skill certification
(8) To expand certification facilities
(9) To increase skill competition and encourge international skill Olympic competition

3. Integrate vocational training system
(1) To proceed vocational training need assessment and to increase people's awareness of VTC
(2) To prudently set up all of vocational training standards
(3) To enhance vocational training administrative system
(4) To enhance vocational training management and to establish professional system
(5) To legislate acts and regulations for business and industry to encourage their involvement of vocational training
(6) To enhance the authority of "Skill Certificate Council"
(7) To enhance skill labor certification
(8) To enhance the relationship among vocational education, adult and continuing education, job placement bureau, etc.,

Based on the rules above, VTCs need to pay more attention to the following aspects:

1. Vocational trainers have to teach 30.87 hours per week, which do not include their responsibilities for maintence of all teaching facilities.
2. Most of trainees do not have adequate occupational concept. The social moral trends are corrupt. VTCs can do nothing with it.
3. Vocational trainers have less chances of inservice training and they need it very much.
4. Vocational training have been limited to certain trade areas. It can not be flexibly adjusted.
5. Minority groups such as handicapped or women do not have the equal share of vocational training.
6. In the long or mid range plan, all of specific vocational trainers are still remaining on the current trade areas.
7. Skill license or certification need the cooperation of business and industry support.

Possible Model Structure

According to input, output, and limitations, the basic system model is almost formulated. The basic model must be able to cope with most of the current problems and also provide solutions to current administrative issues. Therefore, it must fulfill the following conditions:

1. Could provide man power planning and comply with educational plan.
2. Could adjust to new technology and redesign its training plan.
3. Have over all control to different administrative VTCs.
4. Could flexibly adjust vocational training acts or rules.
5. Have over all control to budget distribution.
6. Set up specific units for minority groups, such as: handicapped, women, or specific vocational training groups.
7. Could flexibly handle personnel system.

After consideration of above items, other possible weaknesses still exist. How to eliminate all these possible effects and to set up a good model, are some considerations posted below:

1. How to ascertain that vocational trainers promote in a regular system?
2. How to make all VTCs operate the same with school system?
3. How to make all VTCs even in administration, and increase some units for handicapped, women, and specific vocational group?
4. Should VTCs belong to the local government?

Feedback System

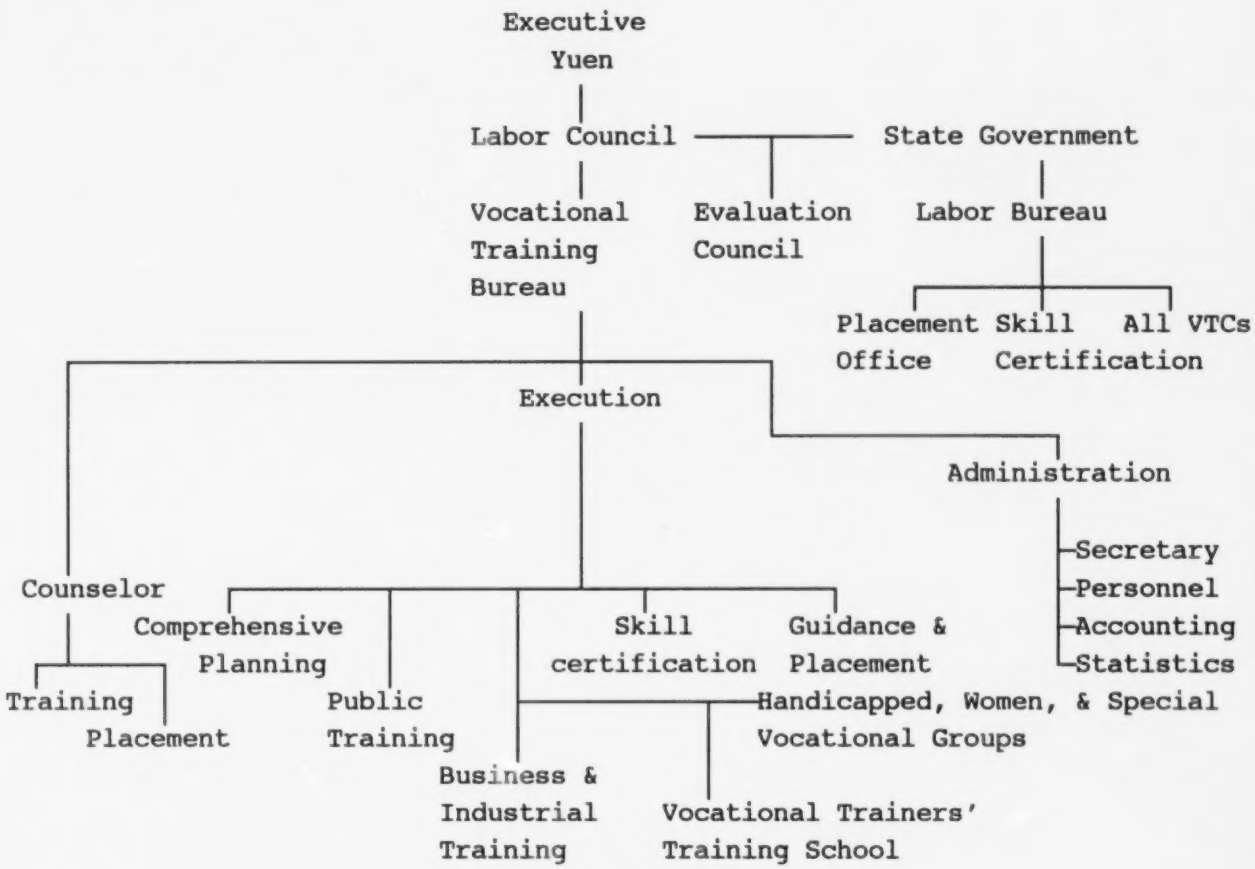
Model must have feedback system to help upgrade the execution. This study suggested that a council should be formulated by non-vocational training members and vocational training research teams to evaluate personnel administration and cost effectiveness.

Model Evaluation

The strengthes and the weaknesses of vocational training administration model are:

The proposed model is posted as Figure D.

Figure D: Central and Local VTCs Administration Model



(Source: Adopted from Vocational Training Bureau Administration and modified)

(A) Advantages:

1. Could execute current vocational training functions.
2. Set up new units for handicapped, women, and specific vocational group.
3. VTCs' administration is running by vocational trainers.
4. VTCs' accounting & personnel control under a specific administrative unit.
5. Vocational trainer could be categorized as: assistant trainer, associate trainer, trainer. If they are interested in administration they have choice to involve in.

6. Set up a vocational trainer school to prevent from over concentrate on specific trade areas.
7. Local government control VTCs to assure that all of VTCs have the equal standing. Central government provides certain expenditures in accordence with the cooperation and effectiveness.
8. Evaluation council suggest current legislation amendment or revise specific trade adjustment.

(B) Disadvantages:

1. This model is still in its developing stage. There are not further data to support its integral.
2. Budget is still controlled under Legislative Yuen.
3. Budget distribution can not explain through model.
4. The linkage between local government and central government can not explain by model.
5. Personnel adjustment and its operation are not clear in the model.

Model Revise and Integration

Evaluation council proposed suggestions and revisions in the first five years. After model were revised in the fifth year, evaluation council could proceed the same process in two or three years instead of per year. Also evaluation council members should be elected each year.

Summary

This model development is just an attempt to suggest vocational training bureau when further system change is needed.

C. Study of Vocational Training Instructional Model in Taiwan

Summary of Problems

All VTCs' vocational trainers confronted with many instructional problems, such as:

1. There are too many teaching hours in a week -- the average teaching load for vocational trainers are 24.53 hours per week, but the real teaching load is 30.87 hours per week. For a professional technical course, the instructional preparation before teaching is far more than most of general courses in average. To a general course, the preparation hours before teaching is about

three to six hours for an hour of teaching course, which depends on teaching experience. For 30 hours of teaching, the preparation periods would be at least 90 hours. There are only 168 hours in a week (24 hours in a day). A 90 hours of basic preparation hours plus 30 hours of teaching hours is 120 hours. One hundred sixty eight hours deduct one hundred twenty hours is only forty eight hours left, which must include sleeping and miscellaneous chores. All these numbers indicate one thing for sure -- there is not quality instruction at all.

2. There were too many chores for vocational trainers -- trainers must take response for recruit members, and maintain many routine chores.
3. VTCs' administration have been limited to its budgets.
4. Vocational trainers need in-service training very urgently.
5. The VTCs' training areas have been limited by its current trainers; they can not provide training for many high demanding fields. If they did provide new technology or service related training, trainers become the burden of VTCs after the rapid social changes.
6. VTCs face the student member recruit problems for too many in technology intensive trades, and too less in labor intensive or drudgery trades.

Possible Model Structure

To formulate the possible model, following key points should be noted according to above lists:

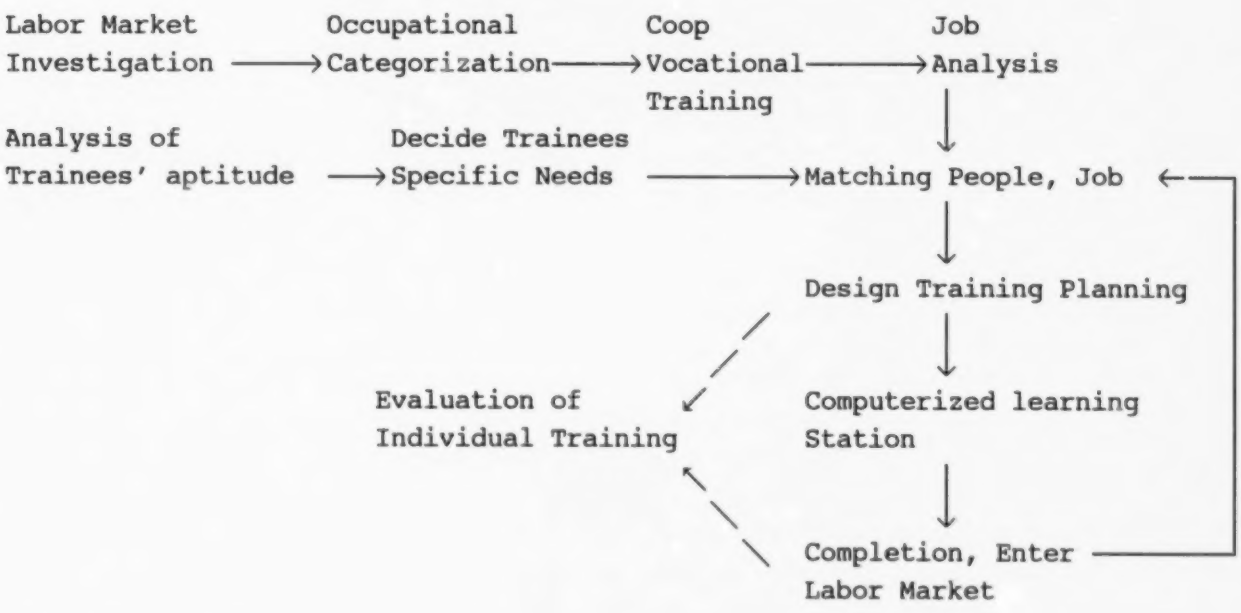
1. With regards to individual interests, instruction should be individualized oriented.
2. Instruction must cope with social as well as facilities changes.
3. High technology instruction must go with adequate devices.
4. It must be carefully evaluated as trainees proceed through the whole training process.
5. The trainees' learning plan must be able to covered by the instructional model.
6. The trainees must be able to keep steps with instructional goals, and to tell the learning difficulties.
7. Model must be able to reflect the training safety, related instructional resources, as well as rules for training.

8. Placement office must keep up with training administration and make all of vocational trainees have place to go after the completion of VTC training.

According to the above key notes, Sweeney's (1982) concept of effective guidance and leadership were referred to as an integral part of model development.

A Vocational Training Instructional Model in Taiwan was developed as Figure E.

Figure E: Vocational Training instructional Model



Feedback System

The feedback mechanism of vocational training instructional model is hard to explain in details. To an effective study, learning station might be a good idea. The feedback system aims at the application of high technology facilities and its use to instruction. High technology facilities make it possible to have low cost self-imposed individualized high quality instruction. Also, a vocational trainers only have to control and direct student learning. Trainees just have to follow the instructions of the learning goals as well as the employers' demand. As trainee meets both ends, it is the time of his course completion. This feedback mechanism gets feedback responses from both employers and trainees to evaluate the whole training plan and its eligibility to labor market.

Model Evaluation

The understanding of labor market will help trainees' placement after their completion of vocational training. If occupational categorization data were available, VTCs' planning should be more easy. It can categorize VTCs according to their trade facilities and provide adequate trade fields. If there is no way to provide these trade areas, local educational resources or cooperational training might be an optional choices for vocational training.

Trainees should have their vocational orientation, then, they should be categorized or advised according to their aptitudes or vocational tendency. After getting their agreement, VTCs provides adequate training plan and evaluate their learning activities. In a self-imposed learning station, vocational trainers direct them till they can fulfill the employers' demands.

The basic model mechanism is very idealistic. With regard to the modern high technology facilities, especially, the use of computer software and hardware could heop us reach these goals without any difficulty. But the budget which all VTCs can afford. After couple years of investments, all VTCs training cost will be down and the increasingly flexibility among training would become very obvious.

Model Revise and Integration

Because of insufficient budget, inadequate vocational trainers, and inappropriate administration, the VTCs are not able to adopt or perform the instructional model even though VTCs have set specific instructional goals with adequate facilities. This researcher intends to provide different curriculum and multi- media computer aided instructions to upgrade individualized vocational training. This model still needs three to five years to revise and integrate.

Summary

Zeigler, B. P. (1984) stated in preface of his book: "Multifacetted modelling --and-- discrere event simulation"

> "Modelling, in its computerized form, increasingly will take its place as the key knowledge component in all forms of decision making in modern life. Consequently, more attention should be paid to understanding the processes by which models are built and employed."

Daily experience tells us, in a dynamic complicate system, the problem solving techniques usually are not adequate. Though some

argured about the knowledge, phenomenum, nature, economics, social science and all of integral parts, they are not applicable for solving a real complicate system. A computer simulation of decision making is but a training for engineer or planner to proof their effectiveness after so much involvement of time and money.

This study also is limited by its complicate system. Still, it provides an approach of an attempt to vocational trainers a concept of possible way to think and to plan.

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